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Letter dated 7 May 2009 from the Permanent Representative of Turkey to the United Nations addressed to the Secretary-General

I have the honour to transmit herewith a copy of the Ministerial Statement adopted at the fifth World Water Forum, which was held in Istanbul from 16 to 22 March 2009 (see annex), and the Istanbul Water Guide (see enclosure).

I would appreciate if the present letter and its annex could be circulated as a document of the sixty-third session of the General Assembly, under agenda item 49.

Best regards.

(*Signed*) Baki **İlkin**
Ambassador
Permanent Representative

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Annex to the letter dated 7 May 2009 from the Permanent Representative of Turkey to the United Nations addressed to the Secretary-General

Ministerial Statement

We the Ministers and Heads of Delegations assembled in Istanbul, Turkey, on 20-22 March 2009 on the occasion of the 5th World Water Forum, 'Bridging Divides for Water', are determined to address the global challenges related to water within the context of sustainable development. We, therefore:

Reaffirm the prior commitments made by national governments to achieve the internationally agreed upon goals on water and sanitation, including those in Agenda 21 and the Johannesburg Plan of Implementation, acknowledge the decisions of the United Nations Commission on Sustainable Development (UNCSD) and the multilateral agreements relevant to water, water use, sanitation and health.

Recognize the need to achieve water security. To this end, it is vital to increase adaptation of water management to all global changes and improve cooperation at all levels.

Recognize that the world is facing rapid and unprecedented global changes, including population growth, migration, urbanization, climate change, desertification, drought, degradation in land use, economic and diet changes.

Recognize, in particular, the specific challenges facing different parts of the world, especially in Africa, in meeting the MDGs and attaining an acceptable level of water security for socio-economic development.

Therefore, we the Ministers and Heads of Delegations, present at the Ministerial Conference of the 5th World Water Forum, share the view on the following:

1. We will intensify our efforts to reach internationally agreed upon goals such as the MDGs and to improve access to safe and clean water, sanitation, hygiene and healthy ecosystems in the shortest possible time through appropriate policies and adequate financial resources at all levels.

2. We will further support the implementation of integrated water resources management (IWRM) at the level of river basin, watershed and groundwater systems, within each country, and, where appropriate, through international cooperation to meet economic, social and environmental demands equitably, inter alia to address the impact of global changes, taking into account the interests of all stakeholders, using a participatory process in decision making and planning while creating better links between relevant sectors to achieve solutions that benefit all parties.

3. We endeavour to improve water demand management, productivity and efficiency of water use for agriculture including, where appropriate, building irrigation networks and also improving rain-fed agriculture to increase crop productivity and conserve water with a view to

achieving sustainable production of sufficient food for rapidly increasing populations, and changing consumption patterns, ameliorating living standards, especially in rural areas, and ending poverty and hunger consistent and in harmony with internationally agreed development goals and other relevant international obligations/agreements.

4. We support country-led development projects in different sectors related to water, especially with regard to energy and food security and poverty eradication. We will work to build new and maintain, strengthen, improve existing infrastructure for multiple purposes including water storage, irrigation, energy production, navigation and disaster prevention and preparedness that are economically sound, environmentally sustainable and socially equitable.

5. We will strengthen our understanding of the impacts of global changes on water resources, natural hydrological processes and ecosystems. We will work to preserve environmental flows, increase the resilience of and restore degraded ecosystems, taking advantage of new mechanisms as well as partnerships with foresters to enhance water-related forest services.

6. We will strengthen the prevention of pollution from all sectors in surface and groundwater, appropriately applying the polluter pays principle, while further developing and implementing wastewater collection, treatment and reuse.

7. We will consider the need of water-short areas to invest in desalination and wastewater treatment for reuse and provide technological support and know-how to make them sustainable and affordable.

8. We will respect international law providing protection for water resources, water infrastructure and the environment in times of armed conflict and cooperate in its further development, as necessary.

9. We resolve to develop, implement and further strengthen transnational, national and/or sub-national plans and programmes to anticipate and address the possible impacts of global changes. Assessments of varying hydrological conditions, extreme water events and the shape and functionality of existing infrastructure are essential in this context. Investment efforts to establish necessary infrastructure, to increase storage and drainage capacity in particular, needs to be scaled up, taking into account water efficiency.

10. We resolve to work to prevent and respond to natural and human-induced disasters, including floods and droughts. We resolve to proceed, where possible, from crisis management to disaster preparedness, prevention of human-induced disasters and risk management by developing early warning systems, implementing structural and non-structural measures, both for water resources and access to water and sanitation, and building capacity at all levels. We resolve to also take necessary post-disaster mitigation and rehabilitation measures for affected people and hydrological systems.

11. We will strive to improve water-related monitoring systems and ensure that useful information is made freely available to all concerned populations, including neighbouring countries.

12. We will clarify at all levels, as appropriate, the roles, rights and responsibilities of all actors and promote cross-cutting coordination and policies, in particular to provide people with access to water and sanitation as a key to achieve sustainable development while maintaining responsibility in line with social considerations, with national governments and local authorities, and support various forms of partnerships.

13. To improve at the national level the governance of the water sector, we will, as appropriate, aim to:

    a) Promote institutional water management reform,
    b) Strengthen water sector laws and regulatory frameworks, increase political and administrative accountability for their implementation, and ensure their effective enforcement,
    c) Prevent corruption and increase integrity in implementing water-related policies, plans and practices,
    d) Ensure transparency in decision making processes,
    e) Strengthen public participation from all water stakeholders.

14. We will support scientific research, education, development and adoption of new technologies and broadening of technological choices in the field of water and promote their utilization towards sustainable use and management of water resources to increase the adaptive capacities and resiliency of societies. We will make efforts to promote international cooperation in the development, application and diffusion, including dissemination of technologies, practices and processes in water issues, as well as in scientific, technological, socio-economic and other research, towards improving universal access to water and sanitation.

15. We acknowledge the discussions within the UN system regarding human rights and access to safe drinking water and sanitation. We recognize that access to safe drinking water and sanitation is a basic human need.

16. We will take, as appropriate, concrete and tangible steps to improve and promote cooperation on sustainable use and protection of transboundary water resources through coordinated action of riparian states, in conformity with existing agreements and/or other relevant arrangements, taking into account the interests of all riparian states concerned. We will work to strengthen existing institutions and develop new ones, as appropriate and if needed, and implement instruments for improved management of transboundary waters.

17. We invite international organizations and institutions to support international efforts to enhance the dissemination of experiences and sharing of best practices on sustainable water resources rehabilitation, protection, conservation, management and utilization.

18. We strive to prioritize water and sanitation in national development plans and strategies; develop local and national/regional water management plans; allocate adequate budgetary resources to water management and sanitation service provision; to lead donor coordination processes, and create an enabling environment for water and sanitation investments. We strive to mobilize resources from all sources, including public and private.

19. We will promote effective use of financial resources from all sources, including international financial institutions, development partners and beneficiary countries to increase support for water management, water supply and sanitation. We also will resolve to support more effective and diversified support, credit and financial management systems that are easily accessible and affordable.

20. Acknowledging that new and adequate resources are needed to achieve the MDGs, we call upon the international community, development partners and private sources of financing to invest resources to complement the efforts made by developing countries and countries with economies in transition, to develop sustainable water resources management and to build the infrastructure base for a sustained socio-economic growth, especially in Africa and least developed countries.

21. We acknowledge the need for fair, equitable and sustainable cost recovery strategies and we will therefore promote and implement realistic and sustainable financing strategies for the water sector, especially water supply, good water quality and sanitation sectors. We acknowledge that exclusively economic approaches and tools cannot capture all social and environmental aspects in cost recovery. Financing strategies should be based on a best possible use and mix of tariffs for all forms of water services, taxes and transfers to cover needs related to infrastructure development and extension, operation and maintenance.

22. We finally acknowledge that water is a cross-cutting issue. Thus, we will communicate our message to those outside of the water sector including the highest political levels. We will make our best efforts to follow this issue in order to develop innovative governance, integrated water policy management, legal frameworks, cross-sectoral policies, financing mechanisms and technologies in combination with capacity development.

Therefore, we the Ministers and Heads of Delegations present at the 5th World Water Forum Ministerial Conference share the view to:

- ***(a)*** *Convey* the results of the 5th World Water Forum Ministerial Process to relevant international and regional processes,

- ***(b)*** *Challenge ourselves and call upon all stakeholders to take into account* this Ministerial Statement and its recommendations to be incorporated, as appropriate, into our national policies related to water resources management and services and link these results to the 6th World Water Forum, and take note of the Istanbul Water Guide and its recommendations (see enclosure).

- ***(c)*** *Continue to work together* with Parliaments and Local Authorities, to address water and sanitation issues in a mutual fashion,

Finally, the Ministers and Heads of Delegations present at the 5th World Water Forum Ministerial Conference would like to:

- ***(d)*** Thank the Government of Turkey, Istanbul Metropolitan Municipality and the World Water Council for their organization of the 5th World Water Forum and the Ministerial Conference.

- ***(e)*** *Note with appreciation* the participation of National Governments, Regional and International Organizations and stakeholder groups in the Ministerial, Regional and Thematic Processes of the 5th World Water Forum.

Agreed to in Istanbul on 22 March 2009.

Enclosure

Istanbul Water Guide[1]

Background

1. The Ministerial Declarations of the past World Water Fora have been important contributions in laying down the world's priorities concerning water resources and services. Yet, water-related problems still persist, and are even becoming more significant as a result of global changes affecting, in particular, the economy, the demography and the state of natural resources. There is thus a need to accelerate action by all actors to make progress towards creating a water-safe environment for the world's citizens.

2. The goal of the Istanbul Water Guide is to go beyond those statements and create an agenda for action by national governments in partnership with stakeholders to address the critical areas of water resources management, governance and finance.

3. The Istanbul Water Guide represents recommendations from experts from throughout the world and is not intended to be a binding document for governments but has two major objectives:

- To help and guide governments to adjust their priorities and actions plans according to the difficulties they face; and
- To inform relevant intergovernmental processes of the results of the 5th World Water Forum Ministerial Process.

4. In the context of this 5th World Water Forum Ministerial Process, the term "Global Changes" is referred to as including, but not limited to population growth, migration, urbanization, climate change and land-use, consumption and economic changes, and therefore increasing pressures on natural resources and ecosystems.

5. The Istanbul Water Guide is configured to "mirror" the Thematic Programme of the 5th World Water Forum to make the connection between the technical side of the Forum and the political, "Bridging Divides for Water", the over-arching theme of the 5th World Water Forum. Contributions were made directly by the Thematic, Topic and Regional Coordinators of the 5th World Water Forum and other significant international meetings and Regional Summits and consolidated into a single text which outlines the issues the world is facing with regards to water and sanitation as well as objectives to address those issues.

The problem

6. The world is facing changes at a faster rate than ever seen before. These changes such as population growth, migration, urbanization, land-use changes and climate variability/change will drive the way in which water resources need to be managed in the future. They also call for concrete contributions from water policies and actions to help the world cope with these changes. While climate change has been the most talked about topic, other changes taking place will likely

[1] This **Istanbul Water Guide** was prepared through a series of Preparatory Committee Meetings (PrepComs) with the attendance of representatives of national governments as well as major and stakeholder groups and the Thematic and Regional Coordinators of the 5th World Water Forum. This document is based on the broad views of the participants of the PrepCom series and the outcomes and recommendations of a number of technical and political meetings, such as symposia, conferences, summits and regional water fora held until early 2009 (see list at end of document).

affect water resources and services and their management to a much greater degree. The population of the planet is estimated to increase by 50%, meaning 3 billion additional inhabitants, by 2050. More than half of the world's population now lives in cities, and this increasing urbanization is set to continue. Population will continue to increase as will rural-urban migration, adding difficulty to reach the agreed Millennium Development Goals (MDGs) on access to water and sanitation and increasing pollution at the same time. The demand, and probably prices, of natural resources and energy will increase as the planet's inhabitants grow in number and consumption increases. Humans are altering global systems at a rate not previously experienced. These drivers, and the constraints that limit the ability to adapt to them, affect the developed and developing world in different ways.

7. Critical issues have recently been the focus of politicians and media alike. Oil prices, food prices, global economic turbulence and water-related disasters feature high on the list. What the world is not talking about is how these are related to, impact on and are affected by water. There is an inextricable link between all of these issues and water yet the connection is not being made at a higher level, which endangers not only water resources and ecosystems, but humans and their livelihoods as well. It is not well understood within political arenas that water resources are among the important factors that drive the current changes, affecting nations as well as local communities. This adds to the already high impact of polluted water affecting billions of people as well as ecosystems. With the onset of global changes, the world must confront these issues urgently so as not to let both lives and economic well-being slip through our fingers.

8. These messages have to be taken to those outside of the "water box", which include the highest political levels. The cross-cutting nature of the water sector makes it an important resource for other interests. Often, decisions affecting water are not in the hands of water professionals but in the hands of decision makers in related sectors. The water sector must help inform these decision makers in order for them to make more sound choices about how they utilize water in their activities.

9. Throughout history, water actions have been societies' main activity to adapt to changes in climate and nature. They have been the means by which decision makers create ways to avoid social disruption and violence under the shock of events with too much or too little water. The 5th World Water Forum offers the opportunity to help create a framework for assisting nations and communities to mitigate for and adapt to those global changes in a sustainable way. The situation has already been critical for decades, but national and local governments are not prepared for the changes that will occur, potentially making a worse situation. Let us set the agenda now while we have the opportunity.

Theme I: Global Changes and Risk Management

Element 1: The Role of Water in Adapting to Climate Change

10. **Think outside the "water box".** Climate change/variability affects not only the hydrological cycle, but areas that are closely related to water, forest and land. An integrated approach to adapt to these changes through better management of space, land and water as media for mitigation, adaptation and disaster preparedness and to ensure food security, energy security, economic development, environmental protection and equity is required. Water is more affected by food, energy and other policies than by water policies themselves. It is recommended that the water community finds ways to help politicians and experts of other sectors to understand these broadened perspectives and their implications for policies. It is also recommended that national governments, including ministries of agriculture, forestry, interior, public works, industry, finance, energy, health, education and other sectors "outside the water box", take into consideration the impacts of their policy choices on the hydrological cycle that affects rural, populated and urban areas. The strategic impact assessment is a tool that can add value with thinking "outside the water box" for the development of high level policies and identification of hot spots.

11. **Develop national and/or sub-national water-related adaptation strategies.** National and sub-national strategies need to be developed for adaptation to climate change/variability taking into account international adaptation programmes. These need to be integrated in existing and national IWRM plans and strategies. Assessments of needed infrastructure for adaptation should be carried out and then required infrastructure planned and financed. Adequate approaches, such as climate-friendly small-scale technologies, besides large-scale infrastructure should be taken into consideration, not only because of potential impacts, but also the long time frame for construction. Water can be seen not only as part of the problem, but part of the solution with regards to climate change. Groundwater carries a buffering capacity against climate change; therefore sustainable groundwater management, desalination and wastewater treatment should be part of the national strategies. Hydropower development and inland navigation needs to be revisited and developed as an adaptation measure. Non-structural adaptation measures such as spatial planning, ecosystem protection, social concerns, communication, awareness-raising and risk management plans are essential. Support rural areas as they are the foundation of agriculture and are extremely sensitive to global changes. Projections of climate change impacts should be developed at a smaller scale and localized to provide relevant information to policy makers and water managers responsible for major urban areas. The importance of collection and dissemination of climate and hydrological information is stressed.

12. **Apply the IWRM approach to address adaptation to climate change.** The impact of climate change on the water cycle should be assessed and communicated. Capacity development to support better management of water resources at all levels, national, regional and local, including river basin organizations (RBOs) should be supported to build resilience to climate change. Application of the IWRM approach will balance social and economic impacts, minimise environmental impacts and preserve ecosystems.

13. **Identify the countries and communities that are most vulnerable to the hydrological impacts of climate change.** Areas identified by the IPCC as most vulnerable to the impacts of climate change include the least developed countries and small island developing States (SIDS), low lying densely populated coastal areas, areas affected by glacier melt, and arid areas with fragile populations, economies and environments. International efforts to identify "hot spots" and make accessible operational tools to further identify areas and groups that are at highest risks from the hydrological impacts of climate change should be scaled up. Strategic Environmental Assessments can help identifying vulnerable locations and systems, to be followed by factoring in climate proofing into water resources management and water services.

14. **Design infrastructure projects to better manage hydrologic variability, including the likely effects of climate change.** Infrastructure projects should anticipate the likely affects of climate change as well as hydrological variations. Infrastructure should be redesigned and re-

engineered as necessary to withstand extreme events and to perform under changed circumstances.

15. **Develop long-term scenarios and strategies for action in all planning activities.** To cope with the impacts of increasing climate variability and climate change on water and livelihoods, including the uncertainties, a longer-term horizon is required for community development and involvement and large infrastructural investments, beyond the planning horizon adopted by the Millennium Development Goals (2015).

16. **Incorporate climate change assessments in National Plans related to water.** At the national level, integrate an assessment of climate change impacts into National Water Plans and create adaptation measures in line with those impacts for sustainable water security in social, environmental and economic needs.

17. **Close the financial gap for adaptation.** While it is a nation's responsibility to finance their national water management programmes, climate change may add additional challenges within the overall development/sustainability agenda, resulting in the need of additional external financial resources for developing countries to implement adaptation measures. While recognizing that several financial initiatives are being launched recently on mitigation and adaptation, the additional needs cannot be met with the present (inter)national adaptation funding instruments alone.

Element 2: Water-related Migration, Changing Land Uses, Human Settlements and Water

18. **Improve the knowledge base on the change of water-related population dynamics.** As the window for identifying appropriate adaptation pathways to global changes narrows, it is imperative to address how changing climatic and environmental conditions affect individual and group decisions to migrate. Assemble data and relevant scientific information on the subject is pertinent in order to develop strategies to manage migration. Understand the dynamics of agricultural development that is related to population dynamics especially between rural areas and urban areas in developing countries.

19. **Strengthen institutions and policies, which bolster resilience in populations.** Policies are needed, which strengthen resilience, systematically reduce incentives that drive environmental degradation, improve livelihood opportunities and provide enhanced risk management capacity. These policies should include input from all major groups/stakeholders and address cultural and gender concerns as to strengthen civil society and major group roles.

20. **Increase awareness about the impact of environmental degradation.** Knowledge about degradation of water resources and climate change can guide governments, migrants, and potential migrants to take necessary precautions for the safety of populations.

21. **Develop sound monitoring systems.** Take stock of and improve existing monitoring systems and develop new and innovative ones.

22. **Improve legal frameworks.** Include environmentally induced migrants, environmentally displaced people and internally displaced populations due to water related effects within international legal instruments. Improve the existing international legal instruments to protect the rights of displaced individuals and/or communities.

23. **Provide adequate humanitarian response.** Environmental changes and armed conflict may result in substantial human movements, which will require adequate humanitarian efforts to avoid escalating tensions. Natural disasters and armed conflict will displace large numbers of people temporarily, while the steady and continuous impact of climatic stressors will permanently displace many more people over an extended period. In the face of environmental stress, assistance must be in place to prevent crisis and maintain peace among resource-stressed and possibly poverty-

stricken groups on the move as well as assess impacts of sanitation and waste creation of those migrating and address them.

Element 3: Managing Risks and Disasters

24. **Assess the risks and possible consequences of water-related disasters.** Water-related natural disasters, namely droughts and floods, are the primary killers, and heavily affect millions of people, especially among the poorest. These disasters are serious impediments to sustainable development and poverty reduction. Huge economic losses can also be ascribed to water-related disasters, including massive impacts to infrastructure, shelter, health and food production. The influence of climate variability/change with the likely increased frequency of droughts and floods will increase the vulnerability of populations. Demographic changes, urbanization, migration and lack of adequate infrastructure are also putting higher numbers of people at risk than ever before. Therefore, assessment of the risks and possible negative consequences of water-related disasters encountered by global changes should be comprehensively studied and understood.

25. **Integrate water-related Disaster Risk Reduction into national development plans and finance.** Within this remark, it must be recognized that adaptation to climate change must take on a high priority for national governments while establishing national and local goals targets for water-related Disaster Risk Reduction. International and regional strategies and action plans also need afforded priority, especially in cases of transboundary risks. Public and private investment in infrastructure, non-structural measures and human resources are needed with safety of populations as a priority.

26. **Increase preparedness level of afflicted populations.** Through the use of raising public awareness, increasing the human capacities of nations, from local to national levels, to confront water-related disasters, the strengthening and development of early warning systems considering vulnerable areas and groups of people, and the creation preparedness indices, to make nations more prepared to confront water-related disasters.

27. **Institute risk management plans/measures.** Shift from crisis management to risk management. Assist rural areas and cities in instituting structural and non-structural risk management plans/measures to reduce damage from water-related disasters. National governments should ensure that urban centres develop and enforce appropriate spatial planning and bylaws that reduce risks of water-related disasters that take into account the various impacts on different major groups.

28. **Protect the access to drinking water and sanitation services during and after disaster and in situations of armed conflict and occupation.** All parties to the conflict must respect International Humanitarian Law protecting objects that are indispensable to the survival of civilian population, such as drinking water installations and supplies and irrigation works. Humanitarian response to the civilian population in general, to women and children, elderly, refugees, sick and wounded in particular must be granted aiming at re-establishing or upgrading drinking water and sanitation installations and supplies disrupted by the disasters or the direct or indirect effects of armed conflict and/or occupation. Combine measures and efforts to prevent any appearance and spread of water-related diseases.

Theme II: Advancing Human Development and the Millennium Development Goals (MDGs)

Element 1: Ensuring Water, Sanitation and Hygiene for All

29. **Develop national and sub-national plans of action.** Each country should develop national and sub-national plans of action, along with appropriate policies, outlining the necessary actions in order to expand access to water and sanitation. Such plans need to include aspects related to appropriate sanitation technologies, wastewater collection and treatment and be tailored to the economic, social and environmental conditions and needs. The plans need to specify short-, medium- and long-term targets and timelines, going beyond the MDG and Johannesburg Programme of Implementation targets. National and sub-national plans should take into account preservation of all ecosystem services. The requirements of underserved urban and rural populations, residents of arid and semi-arid areas and informal settlements, should be addressed appropriately in the development of these plans, while incorporating indigenous knowledge, women's and children's knowledge and needs and give specific attention to vulnerable groups. Priority should be given to schools, health centres, public centres and emergency preparedness. Identify one accountable institution to takes clear leadership of the national sanitation portfolio and establish one coordinating body with specific responsibility for sanitation and hygiene that would work in conjunction with the health and education sectors.

30. **Improve monitoring of access to sanitation and water.** Monitoring, based on data provided by national governments, of access to safe and clean water and sanitation is essential. Existing WHO-UNICEF Joint Monitoring Programmes should be further supported and expanded to include additional indicators, including gender and age-segregated data, such as connection to sewerage networks and wastewater treatment, to measure global progress towards meeting the internationally agreed upon goals on water and sanitation. Develop monitoring of the quality of water, the continuity of water supply, hand washing programmes and segregated sanitation facilities in schools and health centres. At national level, analyse the discrepancies between the various national datasets describing the types of access to water and sanitation in order to strengthen the base and the monitoring of national policies.

31. **Build cross-cutting local, regional and international partnerships.** Increase the efforts and means of governments (local, regional and national), water operators, civil society, NGOs, water users and the private sector to partner together to assume and share the costs, risks, results and impacts of investment in water, sanitation and hygiene. Strengthen local water services through Water Operators Partnerships (WOPs). Establish regional, North-South, South-South North-South-South partnerships to build capacity, exchange best practices, transfer knowledge, strengthen local cooperation and finance projects.

32. **Mobilise resources for water, sanitation and hygiene.** Develop sustainable financing strategies to enable implementation of national and sub-national action plans for water and sanitation. National governments are responsible for defining appropriate budgetary allocations to water, sanitation and hygiene. Authorities responsible for delivering water and sanitation services should implement sustainable cost recovery through a mix of tariffs, taxes and transfers, including Official Development Assistance. Contributions from international financing institutions and development partners should respond to demands expressed by recipient countries.

33. **Build capacity in water, sanitation and hygiene.** Mobilise more technical resources and build institutional, technical, managerial and planning capacity at all levels, but especially at the local level.

34. **Use appropriate, acceptable and economically available technology.** With the full participation of communities, design, implement and evaluate sustainable technical solutions to water and sanitation problems using appropriate, innovative, and economically available as well as indigenous technologies.

35. **Raise awareness on sanitation and hygiene.** Inform both the public and decision makers on the benefits of water, sanitation and hygiene to the economy, health and the environment and make them aware of the sense of urgency of the issue. Promote and make available sustainable, affordable and appropriate technologies to the poor and disadvantaged. Use modern approaches such as community-led total sanitation, marketing for behaviour change, educational programs to change behaviour towards water, sanitation and hygiene. In addition, using such strategic processes as Poverty Reduction Strategy Papers, raise the profile of water, sanitation and hygiene so development agencies take more robust action towards meeting the needs of those without these services.

36. **Consider the full impact of sanitation on health, environment and the economy.** Better take into consideration the sanitary, environmental and economic benefits of improved sanitation, in both developing and developed countries. The International Year of Sanitation 2008 has raised awareness about the direct relation between poor or lack of sanitation and slow progress against health targets, environmental degradation, low productivity and economic activities.

37. **Improve Integrated Sanitation Management.** Recognise wastewater as a resource and develop its use, whenever and wherever appropriate and properly controlled. Wastewater may be used for irrigation and solids, suitably treated, may be used as fertilisers and for energy production from biomass and heat. Integrated Sanitation Management should be considered as part of IWRM.

Element 2: Water for Energy, Energy for Water

38. **Improve the knowledge of the water-energy nexus.** There is too little thought and planning being introduced to the water-energy nexus in most parts of the world, especially developing countries. With fluctuating costs, rapid decisions have to be made about how these two sectors will be interrelated. It is therefore important to develop a good understanding of the water-energy nexus at the local, national, regional and international levels as both water and energy actions place at the global level all the way down to individual communities where water and energy choices take place on the ground. Wide participation from relevant stakeholders is necessary from both sectors to include users and user associations, professional associations, business and the private sector, regulators, governments, NGOs, scientists, the academic community and workers and trade unions, farmers' organizations and civil society.

39. **Enhance the coordination of water and energy policies.** Water and energy policies are rarely well coordinated. Increasingly, agencies are taking a boarder approach to the impacts of water on energy policy and vice-versa. Far better coordination is required to establish markets and investment conditions and regulatory mechanisms, which optimize water and energy use and re use.

40. **Conduct national water-energy-food sustainability assessments.** Not enough is known about how water, energy and food are inter-related and even less about how new trends and climate change will impact the use of both resources. It is important to conduct national water and energy resource sustainability assessments considering agriculture and poverty aspects and through these define sustainable water and energy resources at regional, national and sub-national levels.

41. **Changes in energy prices should be addressed in all aspects of water management.** Energy costs will directly impact water pumping and transportation costs, which may have consequences on water access, especially by the world's poorest populations. Sustainable compensation mechanisms by national, regional and local governments need to be designed well in advance, changes in design may need to be considered and experiences need to be shared among countries and water institutions in order to reduce these impacts. In addition to compensation, options for investing in water conservation, energy efficient pumping and transport mechanisms should be considered.

42. **Use efficient and appropriate technologies in both water and energy sectors.** There is an extraordinary amount of technological innovation that seeks to reduce interrelated energy and water footprints in the delivery of these essential services. Increasing efficiency in energy use in the water sector, irrigation and desalination in particular, and water use in the energy sector is crucial for reducing the footprints of both sectors on the other.

43. **Invest in sustainable and socially responsible hydropower and water storage** . There is an acute lack of infrastructure in some parts of the world for hydropower and storage. Investments in small- and large-scale infrastructure need to be made to make energy production cleaner and greener while at the same time take into consideration the possible advantages these structures have for water-related disaster mitigation, inland transportation, agriculture, poverty eradication and other uses. Application and development should be encouraged, as hydropower is an effective adaptation measure in the context of climate change. Due concern to minimize social and environmental impacts of hydropower should also be given.

44. **Enhance inland waterborne transport.** Inland waterborne transport is a model of transport that is more energy efficient. It is necessary to promote navigational use of watercourses in view of energy conservation, efficient energy utilisation and climate change mitigation, which contributes to improvement of the water-energy nexus.

45. **Conduct more research to better evaluate impacts of biofuels on water resources.** Biofuels may play a significant role during the 21st Century. Impact assessments, risk and benefit studies on the production and use of biofuels will contribute to optimize water use taking into account aspects of quality, quantity and food production.

Element 3: Water and Food for Ending Poverty and Hunger

46. Introduce policies to promote the "more crop per drop". Increasing the prevailing low yields - in both rain-fed and irrigated crop land - has the largest effect on the reduction of water use per kilogram of produced food. The increase in water use efficiency/productivity is mainly caused by reduction of evaporation from the soil, due to better cover of the plants and the resulting increased interception. Higher food prices will incentivize producing higher yields. Poor farmers generally achieve low yields due to lack of resources and technology, and will especially benefit from support to improve yield per unit of water.

47. **Promote small-, medium- and large-scale agricultural development projects.** Governments should promote development of small-, medium- and large-scale, affordable and sustainable infrastructure and other agricultural projects suited to the intended beneficiaries and pay due attention to market access, water cost recovery issues in agriculture, resilience to and managing risks of natural disasters, especially by small-scale farmers, and the possible effects of climate change.

48. **Scale-up the modernization of irrigation and drainage systems.** Development and modernization of irrigation and drainage system schemes in the broad sense (technical, managerial, financial and environmental) will be required at a large-scale to achieve the required increase in food production, eradication of poverty and hunger and protection of the environment. Water can then be saved for other uses or money saved to further develop the source of water. Irrigation is not the only means of providing water for agriculture so that more focus on improving rain-fed agriculture and rain-water harvesting is also needed.

49. **Strengthen and support water-related institutions and associations.** Governments, especially in emerging economies and least developed countries, accelerate the adoption of participatory management of irrigation/drainage infrastructure, the formation of professionally oriented farmer/water user organizations, enhance legal systems and support financially irrigation/drainage administration. Strengthen the transfer and dissemination of irrigation/drainage technological and management skills from professional experts in governments and international

organizations to the farmers' irrigation/drainage management organizations;

50. **Understand the changes in nutrition and diets in the context of supply and demand.** With the increase in the standard of living, caloric intake in emerging countries rises along with the type of food consumed. This has a direct affect on water used in the production of meat and dairy products and crops, which contribute most to the change in diets, are sometimes water intensive. Understanding these trends, especially the importance of livestock, will help develop with the conservation, re-use and allocation of water resources.

51. **Re-engage in the reduction of food losses "from field to fork".** Food losses along the production-consumption chain are considerable and equivalent to a great waste of water resources mobilized at field level. This represents by far the greatest losses in water in agriculture and animal husbandry. Developing programmes to reduce these losses on the demand side of the food chain would generate a significant diminution of the water footprint per capita and would probably as well facilitate access to food by the poorest yet should not take pressure off the efforts to improve system efficiency and efficient use of water in cities, businesses, power generation and agriculture.

Element 4: Multiple Use and Functions of Water Services

52. **Acknowledge the wide-spread practice of multiple uses and functions in water systems.** Historically people, communities, and water managers have been using man-made delivery systems or natural water systems deliberately for more than a single use. In many rural and urban areas, domestic water networks are used for small-scale productive activities. Similarly, irrigation systems are often *de facto* providing large amounts of water within their command areas that facilitate access to water for many other uses through recharge of surface streams and groundwater. Lastly aquatic systems (wetlands including rice-based systems) provide many critical productive and ecosystem services to nearby populations. Under appropriate stakeholder management processes, the practice of multiple uses and functions can prove to be sustainable and very efficient for the community.

53. **Recognize the multiple benefits of multiple uses and functions of water services including for the most vulnerable users.** Multiple use systems can provide the more vulnerable users with low cost services for domestic water, water for agriculture (irrigation, rain fed), homestead, garden, water for cattle, habitats for fish and other aquatic resources and rural enterprise water supplies. The same infrastructure may be used for these services as well as for hydroelectric power and, in some cases, to aid inland waterway navigation. Multiple use systems consider also support important cultural values and functions that are essential for local well-being and livelihoods and might provide ecological benefits which include flood control, groundwater recharge, water harvesting, water purification and biodiversity conservation. Diversification of water sources and of productive activities is instrumental in increasing local community resilience and management to global shocks and risks that may result from climate or market crisis.

54. **Recognise the interrelationship between multiple uses, the functions of water services and integrated water resources management.** Multiple use practices are an inherent element of the Integrated Water Resource Management (IWRM) approach, which should be strengthened. Management agencies of large irrigation systems are often the only water services providers, notably during dry periods. Sound governance of these systems should be ensured to encompass the principles of IWRM and to recognize the needs of all stakeholders.

55. **Capitalize on the sustainability of multi-services water management.** Multi-service water management provides the opportunity to increase the sustainability of water system management by sharing the operational costs and benefits among several uses and users. All water-use sectors need to be taken into consideration. The challenge is to move away from a sector-silo approach to water system management and administration. Service oriented management needs to take a broader approach in order to encompass all realms including sustainable cost recovery, subsidies and to work in an integrated way to develop and manage

community water resources at the local level. It should encompass social aspects, women's and men's priorities and ecosystem services.

56. **Develop country visions and promote local strategies.** All stakeholders at the national level should develop a consistent vision of multiple use and functions of water, including domestic, agricultural, ecosystem and industrial, with a thorough analysis of opportunities and constraints. This vision and these decisions should be reviewed continually in the light of changing circumstances. Local governments should be empowered to overcome sectoral boundaries by integrating elements of long-term technical, financial and cost sharing, and institutional support packages according to the agreed multiple water use needs. Municipalities and cities, irrigation and other water use agencies should consolidate and conserve their water services to achieve integration and coordination of groundwater, surface water, rainwater, wastewater, recycled water and other sources of water supply for urban and rural areas.

Theme III: Managing and Protecting Water Resources and their Supply Systems to Meet Human and Environmental Needs

Element 1: Basin management and transboundary water cooperation

57. **Prepare adaptive strategies.** As potential climate and other global changes increase, they will put at risk food and energy production, social and economic welfare, public health that will require adaptive strategies to manage water resources, both surface and groundwater, equitably in light of the agreed principles of international law. There is also currently a weakness of legal, political and institutional infrastructure that is capable of dealing with the international complexities of transboundary water resources which are related to issues such as national sovereignty, security, water rights, population, economy, culture and ecosystems.

58. **Improve understanding and strengthen cooperation in the transboundary context.** Optimal utilization and effective protection of the transboundary surface and ground water resources are only possible if riparian states cooperate in line with internationally agreed principles. Transboundary water resources present an opportunity for collaboration rather than a source of conflict and a constraint for development. Nevertheless, there exists wide diversity of political, social, economic, cultural and environmental challenges to confront in addition to those arising from hydrological factors. Thus, in order to harness sustainable benefits of transboundary water resources for all riparian countries, joint efforts need to be made. However, this necessitates first the willingness to cooperate which can only come out through extensive dialogue, mutual trust and understanding among riparian states.

59. **Improve the legal and institutional framework of transboundary waters.** In the last 50 years, over 200 bilateral and multilateral agreements have been signed on the use of transboundary water resources. There are several regional and international conventions in force related to transboundary waters. They often form part of cooperative endeavours and a basis for the definition of principles and responsibilities that are considered in international law. National laws should be established or improved to reflect these principles with regards to transboundary waters, where appropriate, in terms of information and data exchange and management and use of transboundary water resources.

60. **Increase the number of river and lake basin and groundwater organizations, their strength and capacity.** Where river and lake basin, coastal, marine and groundwater institutions or organizations do not exist, they are encouraged to be established, especially in the cases of transboundary river basins and aquifers. River basin organizations promote cooperation, mutual understanding and confidence building, as well as improve coordination and exchange of data and information, set up fact-finding procedures and support implementation of joint programmes and projects. Where river basin organizations do exist, to strengthen their capacity to confront the complexities of changing circumstances, including global changes.

61. **Nations are encouraged to seek fair, equitable and win-win solutions in negotiations over transboundary water.** All parties are not equal in strength, yet are in equal need to address water-related issues for their human and environmental needs. The solution for sustainable and integrated water management is to pursue equity, economic efficiency and environmental sustainability where all parties win, including stakeholders.

62. **Develop harmonized integrated water management plans.** Water resources ought to be managed at the basin level with a holistic approach considering their availability and the competing demands, including the demands of ecosystems. Equitable, reasonable and optimal utilization and protection of transboundary water resources as well as protection from water-related disasters with assessment and management of flood risks and accidental pollution is only possible in this way. Development of long-term management plans at the basin level are imperative for reflecting the position and needs of all major stakeholders of a river basin, including the preparation of

contingency plans for mitigating effects of accidental pollution. Riparian states should harmonize both their water supply and water demand management plans for the purpose of making the best possible use of water resources and sustainable water cycle management within the interest of all riparian countries taking into account Principle 2 of the Rio Declaration on Environment and Development.

83. **Support the implementation of Integrated Water Resources Management process.** Support the implementation of integrated water resources management into national and sub-national policies on water resources management as well as the management of surface and groundwater basins. Critically analyze cases of IWRM to share lessons and encourage replication of good practices. Ensure stakeholder participation in local river basin processes and IWRM partnerships. Representation of local governments should be included in local river basin processes and IWRM organizations. Cooperation and the inclusion of principles of sustainable development and IWRM help promote synergy and stability at the national and sub-national levels. Promote IWRM at the basin level, wherever appropriate, and clearly define the roles and responsibilities of coordinating and coordinated sides.

64. **Take into account the interests of stakeholders.** In order to manage basins and build sustainable and equitable agreements when negotiating over water issues, it is very important to include all stakeholders and ensure a participatory process. Stakeholder inclusion can reduce the risk of future disputes.

65. **Promote cross-border monitoring and data exchange.** Through the sharing of technical knowledge and data and information exchange and coupled with joint monitoring/data collection schemes, nations can work closer together, build relationships and improve understanding between one another.

66. **Share infrastructure and their benefits, and jointly finance.** To increase the cooperation of nations on one another and find more benefits that sometimes may not be readily apparent, governments should pursue, sharing benefits, jointly financing projects, seeking also third party-international financing and sharing infrastructure to meet basic human needs and create other benefits such as energy production, irrigation and transportation.

67. **Encourage research, education and training on transboundary water cooperation.** Education on water resources, especially transboundary waters, is lacking among water managers, decision makers and other stakeholders. Increased opportunities for such training should be provided at different scales, from local to international. Develop joint research projects to improve collaboration and understanding.

Element 2: Planning to ensure adequate water resources and storage infrastructure to meet human and environmental needs

68. Encourage a holistic approach within a sustainable development framework. Decisions to build infrastructure should be made on the basis of an assessment of the full range of options available to meet specific needs, based on the principles and approach of IWRM. Storage types have to be adapted to their purposes in size, from small- to large-scale, and type (water harvesting, small dams, large dams, desalination, and surface and groundwater management). Recognize the value of soil, groundwater, surface water, wetlands, snowpack and food stocks as storage.

69. **Develop frameworks and approaches to determine and prioritize needs.** The biggest difficulty of decision makers is to arbitrate between often competing needs. Take into consideration spatial planning, protection of natural resources and ecosystems, social priorities, particularly protecting and improving human health, and adaptation to climate change when determining water needs. Supporting developing countries in their choices by taking account of their unique situations and learning from the experiences of their peers would be very helpful

70. **Expand storage and integrate downstream infrastructure in developing countries.** In many regions of the world, storage infrastructure for surface water and natural and artificial recharge of groundwater is lagging behind and therefore putting at risk the populations that depend on water for irrigation as well as protecting them from floods. In particular the needs of Africa must be addressed in the context of lack of infrastructure. This expansion is justified by storage infrastructure's contributions to economic and social development, but must be carried out without compromising environmental integrity, social justice and international law.

71. **Integrate social and ecological sustainability.** Within the framework of IWRM, social and ecological sustainability should be integrated into storage infrastructure projects with a particular focus on building overall water resilience from the local level to regional river basin scales. This will require a holistic approach concentrating on water to sustain economic sectors such as energy, agriculture, industry and water supply systems, as well as water to sustain other ecosystem services such as carbon sinks and biodiversity for water flow regulation, which are key for water partitioning and long-term human well-being.

Element 3: Preserving natural ecosystems

72. **Promote ecological corridors and networks.** In view of global changes including climate change, it is critical to strengthen the resilience of ecosystems for change by reducing and/or undoing their fragmentation, by promoting ecological corridors such as wetlands and forests, and by sustainable water cycle management and sharing their economic and social benefits.

73. **Consider the impacts of water infrastructure on ecosystems and take mitigation measures, if needed.** Growth of population and the resulting new infrastructure for production of food and hydropower, navigation and flood protection will have impacts on ecosystems and the natural environment. Take appropriate measures to mitigate any potential negative impacts.

74. **Valuate ecosystem services and integrate ecosystems into planning and decision making of development projects.** Plan and incorporate the integration of ecosystem management goals in other sectors, in the context of sustainable development, such as sustainable forest and wetland management, including the non-market value of ecosystems.

75. **Use ecosystems as a buffer to climate change.** Consider the uncertainty climate change may bring to the ecosystem's functioning and acknowledge the value of ecosystems to reduce the risk of non-linear changes, hazards, and the exacerbation of poverty.

76. **Mitigate the degradation of ecosystems and their services.** Create the necessary enabling institutional and social environment for achieving reversal of the degradation of ecosystems while meeting the increasing demands for their services. Cooperate with the forest and land management experts working with international initiatives and organizations with a view to jointly enhance forest and wetland services, in particular the water-related services from forests.

77. **Support programs for biodiversity, water body restoration and ecosystem enhancement.** Actions to protect and rehabilitate ecosystems and natural hydraulic processes are a strong element of adapting to climate change, reducing water-related disaster risks, and balancing population pressures.

78. **Preserve surface and subsurface environmental flows.** Adherence to environmental flows is the obligatory priority vector of surface water use; therefore ecological flows should be given appropriate importance in the strategy of transboundary and national basins' water use as well as in annual planning. Conduct comprehensive inventory studies on environmental flow needs as a large majority of freshwater ecosystems have not been assessed and then establish, implement and enforce standards on limitations to the reduction or alteration of flows.

Element 4: Managing and protecting surface, ground, rainwater and soil

79. **Integrate water quality management.** Integrate water quality management in order to protect all water resources from all pollutant sources and pressures.

80. **Understand groundwater rights, laws and policies and develop new ones, with regulation and enforcement, where there are gaps.** Such information, including social forces and incentives that drive present-day water management practices, will help in the formulation of policies and incentives to stimulate socially- and environmentally-sound groundwater management practices. This is particularly relevant in those situations where aquifers cross boundaries and is therefore important to promote cooperation for the management of water resources. Many groundwater resources across the globe do not have laws and policies that govern them either because of a lack of institutional capacity or scientific knowledge.

81. **Develop policies and institutions to protect and to integrate the management of aquatic ecosystems.** Manage basins not just with a view towards surface waters, but to integrate each basin's surface, ground, rainwater and soil into management practices taking a holistic approach with a view towards sustainable utilization and environmental protection. All four sources are inter-related and affect one another, so they need to be appropriately addressed in cross-sectoral policies governing water management practices.

82. **Incorporate ecological approaches into urban water management.** Such an approach is instrumental in searching for more sustainable solutions that are increasingly characterized by local approaches with reduced environmental flows that avoid large imports of water, energy and materials, exports of pollution and that minimize ecological disruption. Examples include rainwater harvesting, reducing unaccounted for water, wastewater reclamation and reuse, which reduce both the need for importation of high-quality water and the discharge of pollution into receiving waters, and can reduce infrastructure costs.

83. **Upscale good practices in small and medium-scale water resources management.** Promote, disseminate and upscale successful examples of small and medium-scale water resources management on the national, regional and global scales.

84. **Afford more attention to rainwater.** Include rainwater management in national water management plans, where possible, that support social and economic development outcomes and referencing its utility to increase supply in agriculture and water security in the context of changing rainfall patterns associated with climate change. Builds skills and capacity to share knowledge on rainwater management strategies among all water users.

Theme IV: Governance and Management

Element 1: The Right to Water and Sanitation for Improved Access

85. **Review and revise national laws and policies to reflect the principles of the right to water and sanitation.** Review and revise all relevant national laws and policies relating to water supply and sanitation, water resource management, public health, land use, irrigation and related areas to reflect the principles of the right to water and sanitation to ensure progressively access to sufficient, safe and affordable water for personal and domestic uses, educational institution or health centre, as well as access to culturally acceptable, safe and adequate sanitation within each household.

86. **Promote access to water and sanitation.** At the global level, work to mobilize resources from all sources to ensure basic access to clean and safe water and sanitation for all within the shortest possible time.

87. **Establish clear roles, responsibilities and coordination mechanisms to settle disputes.** Ensure that there is a clear allocation of responsibility between relevant government actors responsible for water and sanitation and ensure that there are effective, independent and easily accessible complaints mechanisms to address denials of, or interferences with, any citizen's right to water and sanitation.

88. **Promote information and training available to all.** Require that all water and sanitation authorities provide all relevant information in an accessible form to the people, including on their rights and duties, and that people are given an opportunity to participate in decision-making affecting their rights. Training, as necessary and requested, should be provided for the representatives of marginalized and vulnerable groups in order to ensure that they can participate on an equal footing with other groups and advocate for their rights.

Element 2: Water institutions and water reforms

89. **Carry out policy, legal and regulatory reform.** Reform is an essential condition for sustainable and effective change. Governments should ensure that a supportive environment exists for sustained efforts in all sectors related to water and should clearly define the roles, rights, and responsibilities of all actors and promote cross-cutting coordination and policy development. Special attention should be given to defining policies that incorporate the specific needs of and opportunities for the poor, as expressed by them, for enhancing living standards through access to water supply and safe, gender-sensitive sanitation, irrigation and to ensuring that water allocations are sustainable within hydrological limits in accordance with the principles of IWRM. Reform efforts should come from all stakeholders, both the high political level as well as from the grassroots level while thinking "outside of the box".

90. **Couple institutional reform with capacity development.** Reform should include capacity building, the introduction of more appropriate management systems, and more effective institutional coordination between all players, especially at the basin level. This is particularly the case among government agencies, but there is also a need to build better links between government, the private sector, civil society, and community-level organizations.

91. **Improve the relationship between national and local water institutions at the basin level.** Strengthen coordination between national, basin and local water institutions to create a balance in the oversight and management of these institutions. Harmonize actions between the national and local levels to facilitate effective and efficient management at both levels in order to maximize resources. Incorporate a multi-sectoral approach when necessary. Promote public-private-partnerships, as appropriate. Utilize civil society and the scientific community to enhance these partnerships.

92. **Recognize the role of small-scale water providers.** Small scale water providers, water boards, farmers associations and communities play a large role in extending water supply delivery to poor communities and farmers in urban, peri-urban and rural areas. Facilitate regulatory and monitoring mechanisms for these providers. Ensure affordability and that the poor and low income people are not paying excessive prices for water.

93. **Strengthen and support decentralization efforts.** Empower local and basin-level institutions by strengthening and carrying out decentralization from central governments according to basic recognized principles, as water services are best provided at the local level while having a connection with the national level through coordinated activities. Before decentralization is carried out at a local level, research in order to comprehend the local context under which the reforms will take place and to avoid unexpected and bad consequences. Central governments should create an enabling environment for decentralized institutions to ensure that they have financial, technical, legal and human capacities for effective local management, including coping with rapid urban expansion, poverty and global changes. Strengthen existing local institutions and where local institutions do not exist, establish them while incorporating civil society, user groups, water professionals and other stakeholders in their functioning.

94. **Institutionalize pollution prevention.** Provide clear and enforceable regulations at the government level to prevent pollution of water resources by agricultural, industrial or domestic waste. Similarly, Mayors can rely on the regulators to prevent pollution by agriculture, industries or domestic waste from the city itself.

95. **Recognise the need for clear and sustainable allocation of water for different uses and effective regulation of its application.** Governments at the appropriate level need to allocate the use of water between its many uses and users, having respect to the sustainability of ecosystems, societies and economies. This requires attention to the levels of sustainable abstraction from the natural resource. The application of these allocation decisions and laws and regulations need to be appropriate, enforceable and enforced. This requires appropriately empowered, resourced and informed regulators.

96. **Create effective regulation, monitoring and enforcement.** Ensure effective regulation and monitoring of service provision relating to compliance with access targets, tariff structures, service and performance standards of water resource use, including prevention of pollution and limits on abstraction. Informal service provision should be regulated at least in relation to quality and price of service. Establish enforcement mechanisms where necessary to aid with compliance.

Element 3: Ethics, Transparency and Empowerment of Stakeholders

97. **Engage with a wide range of stakeholders.** In order to achieve sustainable, resilient and effective policies and practices, all stakeholders including governments and representatives of all major groups have to collaborate to reach decisions that relate to water management in the broadest sense. Participatory procedure, including development of indicators, dissemination of information and monitoring, have to ensure input from all stakeholders in disseminating processes, resolving conflicts of interest, lead to equity and in general involve the voice of civil society.

98. **Promote transparency and prevent corruption.** In all aspects of related to the management of water, support fully transparent processes of decision-making. Open water-related institutions, information and processes to transparency. Prevent corruption in the water sector through transparency, good governance, public accountability and access to justice.

99. **Incorporate good governance into water management policies and practices.** Include participation, equality, accountability, from both development partner and recipient nation, transparency, the rule of law and consensus-based decision-making in the governance structure of water resources management.

100. **Promote a water ethic.** Encourage a "water ethic" in policies of water management where there is, for humans, equity in the accessibility to water for future generations.

Element 4: Optimizing Public and Private Roles in Water Service

101. **Improve public sector providers/utilities.** Increase the efficiency and reach of public sector providers, rural and urban, through capacity building, cooperation between water operators through partnerships and increased financial and technical resources. Develop, support and expand the public sector water providers and authorities through rational investments. Decentralize the ability to raise funds to the local levels and strengthen decentralized cooperation so as not to depend on purely government finances where applicable.

102. **Facilitate the choice of the best service providers, regardless of sector.** Utilize all available providers in order to achieve coverage for all under the supervision of government or public water authorities. Stakeholder involvement in these processes keeps both public and private providers accountable to the greater public.

103. **Clearly define and formalize roles.** For all actors, delineate roles of water, sanitation and agricultural services provision and then formalize these roles into contracts, otherwise known as "contractualization", which is the establishment of an agreement with clear targets, mutual commitments and clear differentiation of respective roles, duties and responsibilities between the authority and each of its operators, public or private.

104. **Raise awareness about and promote public and private roles and public-private and public-public partnerships.** Lack of knowledge and understanding of public and private provision of services has hindered the provision of those services themselves. Efforts must be made to raise awareness about the benefits of the roles of the public and private sector provision of water and sanitation services as well as how public-private partnerships carry out these activities.

105. **Strengthen the capacity and efficiency of public authorities.** Public communities should carry out competitive tendering of projects in a transparent, inclusive manner, perform progressive assessments to chart changes over time between operators in order to monitor compliance with standards and regulations, and create benchmarks to compare operator performance with other operators taking into consideration contextual differences. When the possibility of private sector participation of water services occurs, conduct socio-political assessments to determine the feasibility of such a change in provider and take necessary measures to eliminate corrupt practices.

Theme V: Finance

Element 1: Sustainable Financing in the Water Sector

106. **Urgently increase and better-target investments and finance to bridge the gap in financing.** The financial needs of the sector, from water and sanitation, irrigation networks, river basin management, flood risk management, hydropower, wastewater management, rehabilitation of polluted and/or degraded water sources, reservoirs and aquatic systems, data collection and climate change adaptation, are enormous and increasing. Investments in the water sector are crucial to meet the broader MDG targets of reducing poverty, hunger, child and maternal mortality, and the incidence of major diseases, to improve environmental sustainability and realize economic benefits. In spite of recent year's efforts to increase the amount of financing for the sector, the gap between needs and actual investments is actually widening while there are considerable potential benefits that are still untapped. National governments, local authorities, development partners and international financial institutions need to act urgently, not only to increase the finance for the sector but also to improve the targeting and effectiveness of the financing and to create an enabling environment.

107. **Mobilize political will with sound economic and social arguments.** Facilitate a better understanding of the water/poverty eradication/economic growth nexus for decision makers and political leaders. The water sector is fundamental to the poverty reduction, economic development and environmental sustainability agendas; yet it only manages to attract a fraction of the financing that is needed. Improving decision makers' and political leaders' understanding of the economic, social, health, and environmental benefits of investing in water will encourage the flow of sustainable financing.

108. **Ensure operational capacity by coupling "soft" investment and "hard" investment.** Investment in infrastructure needs also investment in institutional frameworks and development and the human capacity to manage, operate and maintain the infrastructure, and vice versa. There is a need to build the technical, financial and managerial and planning capacity of sector stakeholders at all levels, especially local, in order to ensure successful operational outcomes.

109. **Strategic financial planning is a means to establish consensus and build a sustainable cost recovery strategy.** An approach to address the challenges is through strategic financial planning for the water sector. Such plans establish realistic policy objectives regarding access to water and sanitation services that are affordable to public budgets and households. They consider ways of mobilising more financial resources, reducing excessive demand, and improving the cost-effective use of resources. Strategic financial planning helps to reach consensus on policy choices and the way they can be achieved. Such planning processes should engage all relevant stakeholders. This can lead to a more rational use of existing financial resources and facilitate access to additional ones.

110. **Diversify the sources of finance to bridge the gap in financing.** The water sector's capital expenditure requirements are enormous. No single source of finance is large enough to meet its financing needs in the short to medium term. In addition to optimizing the financing from tariffs, taxes and transfers, access to debt and equity financing, from international financing institutions, commercial sources and from domestic financial and capital markets, can be used to bridge the financing gap for capital investments.

111. **Facilitate sub-sovereign access to financial markets.** Governments need to allocate adequate resources to the sub-sovereign level, especially smaller and poorer towns, to finance a critical mass of basic local infrastructure services including water supply and sanitation. These allocations can leverage additional sources of financing from development partner agencies and lending institutions. Such payments/ transfers should be made more predictable, performance-based and better targeted. Governments and financial institutions should also help local authorities and smaller communities to access national and international capital markets and enable better flows and coordination of existing finances. Increase the efforts for both functional and fiscal

decentralization and private sector involvement, where suitable and in the context of an appropriate regulatory framework.

112. **Increase Official Development Assistance (ODA) to capacity development and project preparation.** Development partners and Multilateral Financing Institutions should increase Official Development Assistance to build institutions to prepare for infrastructure projects and build the capacity of water operators to be better prepared to attract new financial resources. Also, improve the modalities for national governments and ODA investment in infrastructure and capacity development of regional importance.

Element 2: Cost Recovery Strategies as a Tool for a Sustainable Water Sector

113. **Adopt fair and equitable cost recovery strategies.** Achieve fairness between all categories of water users while promoting universal access to water and sanitation services. Ensure financial resources by appropriate cost recovery mechanisms for good quality service, maintenance, infrastructure, social objectives and investment as needed. Such changes cannot be made without appropriate institutional and technical reforms to carry out cost recovery reform and to enable cost recovery. Stakeholder participation is crucial in order to achieve consensus and a smooth transition

114. **Encourage sustainable cost recovery.** The public authorities responsible for providing water services should develop sustainable long-term cost recovery policies, anticipating all future cash-flow needs of the service and to support new investments by combining revenues from tariffs that are affordable to each categories of user with the budgetary resources from taxes and transfers that are predictable enough to allow investment. Sustainable cost recovery includes investment and operating costs as well as the cost of maintaining existing infrastructure. Include environmental costs of water services provision in cost recovery for maximum efficiency. Also create pro-poor incentives or alternative cost recovery mechanisms according to domestic circumstances to ensure affordability as seen by these users.

115. **Empower local authorities in implementing sustainable cost recovery systems.** Where local authorities are responsible for service provision, national governments must provide them the necessary authority to implement appropriate and sustainable cost recovery systems, through tariffs, budget subsidies, consistent with international obligations under the World Trade Organization and respective agreements. They should be predictable in order to allow for investment, while ensuring affordability for all through subsidies and/or cross-subsidies that makes access to water affordable for each category of water-user.

116. **Match cost recovery strategies with sustainable development objectives.** Cost recovery strategies should reflect sustainable development objectives. Ensure that tariffs are perceived as responding to principles of fairness, equity and sustainability, access to and consumption of adequate levels of services remain affordable for each category of user, poor and low income level people in particular, and cost recovery policies do not restrict access to water and sanitation services. Review and analyze water and sanitation cost recovery policies according to their implementation in a realistic manner considering peculiarities of poor and low-income people.

Element 3: Pro-poor Financing Policies and Strategies

117. **Promote innovative pro-poor financing policies and strategies.** Promote such initiatives as microfinance, output- and outcome-based aid, the financing of local private sector providers and sharing the costs between the public and private sectors, for connecting the unserved. Subsidizing the initial connection charges is often more effective for increasing access than subsidizing recurrent consumption costs. Improve investment environments by establishing more effective and diverse credit and financial management systems that are accessible and affordable to the poor.

118. **Recognize the role of small-scale water and sanitation suppliers.** Small-scale private water and sanitation suppliers provide water for many marginalized and poor areas where public networked water systems do not reach. It is important to recognize their role and the gap they fill while also defining their role, increasing their regulation and their capacity as well as their financing to utilize their unique niche markets while ensuring affordable prices and their capacity.

119. **Facilitate technology transfer and the generation of additional financial resources.** Incorporate the principle of common, but differentiated responsibilities in this regard.

120. **Reaffirm, in a period of global financial and economic crisis, the importance of governments' continuous support to the water sector.** Recognize that investments in water infrastructure should be duly considered for inclusion in national economic stimulus packages. This could also include the promotion of internationally coordinated financial instruments.

Theme VI: Education, Knowledge and Capacity Development

Element 1: Education, Knowledge and Capacity Development

121. **Share information and knowledge.** Free access to scientific literature for professionals and researchers in developing countries should become an increasingly important factor in reducing the knowledge gap that now exists between the North and the South. Decision-makers should adopt policies and set incentives for their organizations to overcome hurdles of communication, lack of data and skills training, to improve knowledge and know-how and remove limits on the private sector to engage in information and communication services. Development partners should provide more fellowships dedicated to e-learning.

122. **Educate all water users and decision makers.** Concerted global action should be taken to educate and enhance the knowledge of water, sanitation, ecosystems, water production technology and water-related issues to all water users, but especially to decision makers at national and local levels, both in and outside of the water sector, and those that are marginalized by society yet have important roles to play in water resources management. Everyone needs opportunities to access education on water resources such as non-traditional and vocational training. Strengthen the role of the media in this regard. The concepts of virtual water and water footprints are powerful communication tools. They should be further developed and used to influence decision makers in governments and the private sector so that the imports on water scarce regions are taken into account in trade, agriculture and industry policies. These concepts should also be used to educate consumers about the impacts of consumption of food and other commodities on water resources. It is also necessary to give attention to providing water education to children on the conversation of water.

123. **Build on existing local knowledge.** Local actors are at the front line as they are the first in addressing local problems. They hold valuable knowledge and experience and this still too often goes unrecognized. Their knowledge and experience, as well as technology, should be identified and reviewed -decision makers need to learn from these stakeholders and apply the lessons learned, such that they use local capacity and knowledge, work with local reformers, build capacity of local institutions and civil society, and apply the subsidiary principle to empower the local actors. A balanced combination is called for to incorporate top-down (often larger scale) and bottom-up (often smaller-scale) approaches and procedures.

124. **Build learning networks.** Networks are also becoming very helpful to disseminate and share informal knowledge, identify common problems, build attitudes and confidence, and generate new knowledge. South-South and North-South triangular cooperation and networks provide platforms to share lessons and adapt them from one place to another. In addition to these horizontal networks of peers, the need is growing for "vertical" connectivity from networks through which local stakeholders can access global networks and knowledge.

125. **Promote integrated approaches.** Multi-disciplinary problem-based learning and demand-driven research agendas should be promoted to overcome the lack of capacity to tackle with global challenges. Educational and other knowledge institutions should play active roles in multi-stakeholder partnerships for water resources management. This will allow more effective problem solving and better sharing of traditional and formal knowledge.

126. **Create "learning" organizations.** The best organizations in public administration are "learning" organizations, just as knowledge-driven corporations in the private sector tend to be the more successful businesses. They allow themselves to change in response to new challenges and to new knowledge.

Element 2: Water Science and Technology - Appropriate and Innovative Solutions

127. **Combine advanced technology with capacity development.** While it is necessary to be innovative and create new technologies, and especially information technologies, that are cutting edge, this should be combined with the use of indigenous knowledge. Sophisticated technology can only work if it is accompanied with capacity development. Sustained operations, maintenance and skills training must coincide with the use of high-tech solutions. Raising awareness is the first step, however, in making urban water managers, farmers and other water professionals aware technology that is available to them. Considering the cost of energy and food, this is especially true for the use of irrigation technology.

128. **Promote national, regional and international cooperation.** While some technologies are local in nature others can be utilized in any part of the world. International cooperation should be promoted in not only the transfer of technology between countries, but also in the access to data related to technology.

129. **Broaden technological choices.** The range of technology choices for agricultural, domestic and industrial consumption must be broadened to include the improvement of current technologies and overcome limitations, for instance desalination, water harvesting, water reuse and recycling and risk management and disaster preparedness as well as the development of innovative, low-cost technical approaches, such as local household technologies, that can be implemented in poor communities. Where possible, appropriate technologies and their responsible use should be given precedence. How technology and technological options can be used by communities and the participation of those communities in the planning process should always be taken into consideration.

130. **Support and promote global water science programmes.** In order to understand complex interactions between the hydrological cycle, associated biogeochemical cycles and the global drivers, scientific research in these areas needs to be intensified and extended. It is of particular importance to build relevant capacities in developing countries and have the local research community participate in relevant global research programmes. The role of international water education institutions is extremely important in this regard. Appropriate scholarship programmes for developing countries need to be developed and implemented.

131. **Promote science and technology in tertiary education.** In order to properly advance scientific and technological solutions to water resources problems, quality educational opportunities need to be in place in order to attract students to pursue careers in areas where such advances are made. Such opportunities and participation in such programs should be encouraged at the national and local levels.

Element 3: Professional Associations and Networks

132. **Support regional and national and professional associations.** Where national and professional associations exist, for governments to give further support to achieve goals and mandates, especially in Africa. Where no national associations exist, to partner with international professional associations to support the formation of nascent national associations.

133. **Carry out human resources assessment.** It is not currently clear how many people are working in water around in the world, how are their living and working conditions and, where and what are the precise needs of the sector. An urgent requirement is for a periodic assessment of the state of the sector's human resources in order to globally monitor the state of the "professional infrastructure" and help develop a high performance workplace whereby workers have access to the skills required of their jobs, including social priorities.

134. **Strengthen umbrella bodies.** Numerous professional associations and networks exist without a strong, developed umbrella body with the aim of facilitating stronger synergies between these associations and networks.

135. **Engage professional associations in policy and investment.** Professional associations including trade unions, farmers associations, business associations, chambers of engineers provide a wealth of knowledge and expertise on various issues related to water, depending on their central focus, from the local. These associations and networks can be more involved and engaged in capacity building, at the earliest of stages of implementation, to influence policy and investments related to their expertise.

136. **Promote governments and professional associations working together to develop human resources.** Professional associations and networks offer a large amount of sectoral and career knowledge that can prove useful to the development of human resources in the water sector. These associations, in partnership with national and local governments, should promote training and education related to careers in water resources management. Water Operators Partnerships (WOPS) and private educational institutions can assist with these initiatives. Concentrated efforts should be to involve farmers, to gender mainstream human resource policies and practices and encourage professional career opportunities for women and young professionals. With youth being the future, young professionals' associations need to be encouraged, supported, guided and promoted throughout the world. Moreover, help technical people to understand social priorities.

137. **Create better links between sectors.** Coupled with the strengthening of professional associations, it is also essential to create better links with those associations and government, the private sector, civil society, community-level organizations and other stakeholders.

138. **Involve professional associations in national commissions.** Using the experience of international professional associations, governments should invite representatives from these associations to serve in a standing capacity on national science, research and development commissions in order to link effectively research to policy developments.

Element 4: Access to data

139. **Invest in data.** The collection, analysis and compatibility of critical data and information should not be regarded as an expenditure, but as a creditable investment, often financed by tax payers, with high-quality future returns. In particular, the number of basic hydrological stations in many countries is inadequate to satisfy even the minimum needs and yet National Hydrological Services have seen the budgetary allocations for hydrological services systematically cut. National governments should take urgent measures, when appropriate, directed at reversing the growing decline of these networks and should increase support for operational hydrological and relevant meteorological observation networks. This is especially crucial in developing countries.

140. **Understand and assess vulnerability.** A better understanding of the impacts of global changes, including climate change and variability, on water resources and their availability and quality for multiple uses is necessary in order to prepare the required response strategies. Resources should be provided and efforts intensified to improve information and data collection at first and promote research regarding the potential impacts of climate variability and change on freshwater resources in river basins. Activities should include new investments in observations and measurements, capacity building, operation and maintenance of existing monitoring systems, including the redevelopment and upgrading of the existing hydrological networks.

141. **Support from international organizations and development partners.** The international development partner community should support comprehensive projects to improve data collection, including improvement of hydrological networks, data management and

dissemination, which constitute the foundation of all IWRM processes. The United Nations, the World Bank and other international agencies and development partners should assist countries with comprehensive projects, in order to improve their data collection networks and build the knowledge and information bases that are needed to develop and manage water resources in a sustainable manner.

142. **Include monitoring and assessment in data collection.** Simple data collection is not enough and monitoring and assessing the data for trends is necessary for proper adaptation and mitigation measures of water-related problems, floods and droughts in particular. Urgent issues requiring an influx of data collection, monitoring and assessment include climate change, sanitation, access to water, water-related disasters, groundwater and the interface between groundwater and surface water. Assessment should be carried out at local, basin, regional, national and global levels and include a peer review process for performance for those who ascribe to the idea. Reliability, consistency and compatibility of data coming from different sources ought to be ensured.

143. **Promote international and interstate data exchange and cooperation between countries.** For a better understanding of the hydrological cycle under the changing climate, international data exchange should be encouraged. International and national policies should be reviewed and efforts needs to be directed in order to facilitate the international exchange of hydrological and related data and products, so that regional and global studies of freshwater resources and climate change and variability can be conducted and useful results produced for the benefit of mankind.

144. **Strengthen the use of data in decision making.** The role of the water manager is essential to water security in that it includes proposing a comprehensive range of options to meet the desired societal objectives and needs for water security. Data in the hands of water managers enhances their capacity to develop practical solutions. At the same time, decision makers should be sensitized to the importance of data so that quality data can influence policy decisions.

Element 5: Water and Culture

145. **Ensure cultural diversity.** Incorporating traditional and local knowledge about the use, management and conservation of water in water policies, reforms and scientific research will make actions on the ground more sustainable, effective and engaging for those who carry out the work. Through adopting processes and strategies that recognize traditional and local knowledge, and crediting ownership of those to specific cultural groups, this can ensure the viability of cultures and ecosystems.

146. **Recognize, integrate and promote cultural diversities and technologies in water management.** Through recognizing the value of diverse cultural practices and technologies in water management, integrating these practices and technologies with scientific knowledge and developing guidelines and recommendations for incorporating them into water management, strategies and policies can better achieve sustainable water management.

147. **Embed cultural diversity in water governance.** Both national and local governments should create an enabling environment through appropriate reforms of water policy and legislation in such a way that customary law, informal water use practices and cultural diversity are formally recognized and accommodated. Through analyzing water policies and laws to see where gaps are between the modern and traditional, reforming water management organizations' structures to reflect cultural diversity, establishing national-local partnerships to monitor changes promoting cultural diversity, and understanding, respecting and documenting effective traditional water management adaptation strategies, more resource sustainability will exist and help in realizing the Millennium Development Goals.

148. **Evaluate the relationship between cultural diversity, biodiversity and water resource management.** Recognizing marked decline in cultural and biodiversity, governments and development financial institutions should add to their social and environmental safeguards an

explicit concern for cultural diversity and therefore should evaluate the inter-linkages between cultural diversity, biodiversity and water resource management at the project specific, local, national, regional and global levels.

149. **Protect water and its cultural value.** Sacred water sites exist in every nation on every continent. There is the need to identify and then protect these sacred sites. In addition, water's cultural importance is also reflected through songs, stories, designs, dance, music, sports, festivals and multimedia, which should not only be protected as well, but should also celebrate water.

150. **Improve the institutional framework of water and culture.** Inclusion of cultural diversity in water projects and programmes can increase understanding and collaboration and facilitate their implementation. In carrying out transparent participatory decision-making processes, taking into consideration the United Nations' guiding principles, cultural diversity aspects should be respected.

Ministerial Conference Discussion Paper

List of Contributing Documents

Alicante Declaration: The Global Importance of Ground Water

Beppu Policy Brief 2007 (1st Asia-Pacific Water Summit)

Brisbane Declaration: Environmental Flows are Essential for Freshwater Ecosystem Health and Human Well-being

Civil Society Statement - AfricaSan + 5

Commission on Sustainable Development - Thirteenth Session: Freshwater management: policy options and possible actions to expedite implementation

Dushanbe Declaration on Water-related Disaster Reduction

eThekwini Declaration (AfricaSan Conference on Sanitation and Hygiene)

Financing Water for All: Report on the World Panel on Financing Water Infrastructure

First African Water Week: Summary of Proceeding and Outcomes

Geneva Conventions

Global Corruption Report 2008: Corruption in the Water Sector

Hashimoto Action Plan

International Symposium: Water for a Changing World - Enhancing Local Knowledge and Capacity

Lisbon Congress and Kampala Conference: International Association of Hydrogeologists (IAH)

Manual on the Right to Water and Sanitation (COHRE)

Marseille Statement (UNESCO Symposium on Frontiers in Urban Water Management)

Message from Beppu (1st Asia-Pacific Water Summit)

Paris-2007 Statement (UNESCO International Symposium on New Directions in Urban Water Management)

Previous World Water Fora Declarations

Sharm El-Sheikh Commitments for Accelerating the Achievement of Water and Sanitation Goals in Africa

Third International Conference on Managing Shared Aquifer Resources in Africa

Third United Nations World Water Development Report (WWDR-3)

Up to and Beyond 2015: Emerging Issues and Future Challenges for the International Water and Sanitation Agenda

Water for a Sustainable Europe - Our Vision for 2030